



PATENT SPECIFICATION 617,950

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PROVISIONAL SPECIFICATION

Improvements in or relating to Hospital Appliances

I, CECIL HOWELL CULLEN, of The Garage, Langford, near Bristol, a British Subject, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to hospital appliances for use in cases where the patient is unable to leave the bed. In such cases every time the bed has to be made the patient has to be lifted. This requires skill
10 if the condition of the patient is serious, and may necessitate getting the assistance of several persons.

The object of the invention is to provide a hoist whereby the patient can be
15 lifted off the bed and be held comfortably suspended for any desired length of time, for example whilst the bed is being made or the bed linen changed; means may also be provided whereby the patient can
20 be turned over, whilst suspended, either by the attendant or by his own effort.

A hoist made according to the present invention comprises a movable stand, a winch or other winding means mounted
25 on said stand, cords, cables, belting or the like, hereinafter referred to as belting, extending from said winch over suitable pulleys or rollers to depend from said stand and slings or other supporting
30 means formed in one with or secured to said belting for attachment to a patient. Said stand may conveniently be of trestle or other suitable form having a top member supported between two pillars
35 mounted on feet provided with rollers or wheels, said pillars being spaced apart a sufficient distance to be positioned with the top member longitudinally arranged over the bed. The pulleys or rollers may
40 be carried on shoes mounted on, and slidably adjustable as to position, on said top member. The slings may comprise endless belts supported on a roller or rollers carried on the depending free ends
45 of said belting.

One form of hoist for the purpose described according to the invention comprises a stand consisting of two tubular metal pillars mounted on inverted channel

section feet provided with a roller at each
50 end thereof. The pillars are suitably spaced apart and are bridged by a top member formed from inverted channel section metal, the attachment to the upper
55 ends of the pillars being by bolts or screws passing through the top members and into plugs fitted into the said upper ends of the tubes. The pillars are suitably braced to the feet and to the top member for rigidity. A gear box is fitted
60 to one of the pillars containing a worm and worm wheel, the worm being mounted in suitable bearings in the box, the worm shaft being extended to form a cranked handle outside the box. The
65 worm meshes with a worm wheel mounted on a shaft in suitable bearings which shaft also carries a roller rigidly fitted thereto to which one end of a belt is attached, the belt extending up and over
70 another roller located on one of the stays connecting said pillar with the top member. A second length of belting is attached at one end to the first mentioned belt by rivets or the like at a point
75 between the roller fitted to said stay and a further roller carried in a slidably adjustable shoe carried on the inverted channel section member, so that the attached length of belting depends from
80 the roller carried by said shoe, the first mentioned belting extending horizontally along underneath the top member of the stand, passing over and depending from a roller carried by a second slidably
85 adjustable shoe mounted in spaced relation to the first mentioned shoe on the top member of the stand. The lower portion of each length of belting is formed into a loop which loop is adjustable as
90 to length by providing a series of holes in the belting to allow the end thereof to be turned up to be attached to itself to form a loop of given length by means of a bolt passing through the selected holes
95 in the two thicknesses of belting, the bolt being provided with a nut. A bracket carrying a roller is adapted to be

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removably attached to the said loops, the bracket and roller being thus disposed parallel underneath the top member of the stand and being of sufficient length to enable two or more detachable slings or belts (made "endless" by straps and buckles) to be supported on said roller.

The adjustable shoes carried on the top member of the stand may each be formed of a pair of side plates which lie against the front and back of the top member, respectively. The upper ends are provided with apertures through which is passed a bolt screwed into a screw-threaded aperture in the plate at one side but free in the aperture in the plate on the other side, at which end the bolt is bent down and the end is brazed or welded to the outer face of said plate at a suitable point below the adjacent aperture aforesaid.

Each plate is thicker and wider at its lower end and is provided with a shoulder which engages under the free edge of the adjacent limb of the inverted channel section top member of the stand. Through an aperture in the thick portion of each plate is passed the spindle carrying the belt pulley or roller, which is flanged at each end, said spindle being rivetted to the plate at one end and the other end thereof being free in its aperture, the arrangement being such that the upper bolt described herein as bent over at one end is free in the same side plate as the free end of the pulley spindle. The upper bolt extends outside the side plate at the end opposite to that which is bent over, which extension is screw-threaded and provided with a nut having an integral handle which, on turning to tighten the nut, draws the two plates firmly on to the top member in the predetermined position, but at the same time leaving the belt pulley free to be rotated about its spindle. By this arrangement, the shoes can be slackened and slid along the top member of the stand to any desired position, and made secure.

The feet of the stand are formed from lengths of inverted channel section metal, one at the base of each pillar and disposed at right angles to the top member. A roller is mounted on a spindle disposed between the limbs of the channel at each end thereof so that the stand can be moved sideways into position over the bed so that the suspended roller and slings or belts are in a position immedi-

ately above the patient to be lifted. The stand from pillar to pillar is of such length as to permit of the pillars clearing the head and foot of the bed in the operation of pushing the stand sideways, as stated, to straddle the bed from end to end.

In operation, assuming the stand to be placed in position over the bed as herein described, a sling or belt is passed under the patient's back and also his or her legs and passed over the long roller suspended from the rollers carried by the shoes slidably mounted on the top member of the stand and the ends secured together by straps and buckles, or other suitable means. To lift the patient, the handle associated with the gear-box attached to one of the pillars of the stand is turned to wind the belting on the drum fixed on the worm wheel shaft aforesaid. In so doing, the patient is lifted from the bed. On cessation of the winding operation, the patient will remain suspended due to the fact that the reduction ratio as between the worm and worm wheel is in the order of 16 to 1, which, of course, means that a quick turning movement of the handle effects only a gradual lift of the patient and a braking condition when turning of the handle ceases, without the need for catches or other auxiliary means for maintaining the patient in raised position above the bed.

In cases where it is required to turn the patient bodily whilst suspended, endless belts or the like would be employed so that these could run completely over the longitudinally disposed roller. If in a condition to do so, the patient could turn himself over by his own effort, in which case, a strap could be suspended from the top member of the stand which would be pulled to effect the turning over movement.

Detail modifications may be made in the structure without departing from the scope of the invention, for example, the stand could be of trestle form, the slidable shoes could be of other construction to that described whilst conforming to the particular requirements. Further, instead of one long roller for the slings or belts, two or more separate rollers may be provided.

Dated this 17th day of October, 1946.

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70-72, Chancery Lane, London, W.C.2,
Chartered Patent Agents.

COMPLETE SPECIFICATION

Improvements in or relating to Hospital Appliances

I, CECIL HOWELL CULLEN, of The Garage, Langford, near Bristol, a British Subject, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to hospital appliances for use in cases where the patient is unable to leave the bed of the kind comprising a movable stand, a winch or other winding means mounted on said stand, cords, cables or the like, extending from said winch over suitable pulleys or rollers to depend from said stand and slings or other supporting means supported from said cords, cables or the like for attachment to a patient.

According to the present invention, a hospital appliance comprises a movable stand, a winch or other winding means mounted on the said stand, cords, cables, belting or the like extending from said winch over pulleys or rollers to depend from said stand and slings or other flexible supporting means for attachment to a patient, said slings or other supporting means being supported on a roller or rollers suspended from the cords, cables, belting, or the like.

In order that the invention may be clearly understood and readily carried into effect, reference is directed to the accompanying drawing, wherein:—

Fig. 1 is a perspective view of a hospital appliance in accordance with the invention.

Fig. 2 is a sectional elevation of a detail.

Referring to the drawing, the form of hoist illustrated comprises a stand consisting of two tubular metal pillars A, A, mounted on inverted channel section feet B, B, provided with a roller C at each end thereof. The pillars A, A, are suitably spaced apart and are bridged by a top member D also formed from inverted channel section metal, the attachment to the upper ends of the pillars being by bolts or screws passing through the top members and into plugs fitted into the said upper ends of the tubes. The pillars A, A, are suitably braced to the feet and to the top member for rigidity by stays E, E, and F, F, respectively. A gear box G is fitted to one of the pillars A containing a worm and worm wheel, the worm being mounted in suitable bearings in the box, the worm shaft being extended to form a cranked handle H outside the box. The worm meshes with a

worm wheel mounted on a shaft in suitable bearings, which shaft also carries a roller rigidly fitted thereto to which one end of a belt J is attached, the belt extending up and over another roller K located between the stays F connecting said pillar A with the top member D. A second length of belting L is attached at one end to the first mentioned belt by rivets or the like at a point between the roller fitted to said stays F and a further roller M carried in a slidably adjustable shoe N carried on the inverted channel section member D, so that the attached length of belting depends from the roller carried by said shoe, the first mentioned belting extending horizontally along underneath the top member of the stand, passing over and depending from a roller M carried by a second slidably adjustable shoe N mounted in spaced relation to the first mentioned shoe N on the top member D of the stand. The lower portion of each length of belting is formed into a loop O, which loop may be adjustable as to length by providing a series of holes in the belting to allow the end thereof to be turned up to be attached to itself to form a loop of given length by means of a bolt passing through the selected holes in the two thicknesses of belting or a bolt P provided with a nut may be used to make a permanent joint. A bracket Q is attached to the said looped ends of each belt, the brackets supporting a rectangular frame having rollers R, the frame being supported by means of a rod S disposed parallel underneath the top member D of the stand. The frame is of sufficient length to enable two or more detachable slings or belts T (made "endless" by straps and buckles) to be supported on the two lower side members.

The adjustable shoes N carried on the top member D of the stand are each formed of a pair of side plates which lie against the front and back of the top member (see Figure 2) respectively. The upper ends are provided with apertures through which is passed a belt U screwed into screw-threaded apertures in the plate at one side but free in the aperture in the plate on the other side, at which end the belt is bent down and the end is brazed or welded, as at V, to the outer face of said plate at a suitable point below the adjacent aperture aforesaid.

Each plate is thicker and wider at its lower end and is provided with a shoulder W which engages under the free edge of the adjacent limb of the inverted channel

section top member D of the stand. Through an aperture in the thick portion of each plate is passed the spindle X carrying the belt pulley or roller M, 5 which is flanged at each end, said spindle X being riveted to the plate at one end and the other end thereof being free in its aperture, the arrangement being such that the upper bolt described herein as bent over at one end is free in the same 10 side plate as the free end of the pulley spindle. The upper bolt U extends outside the side plate at the end opposite to that which is bent over, which extension 15 is screw-threaded and provided with a nut Y having an integral handle which on turning to tighten the nut Y, draws the two plates firmly on to the top member in the predetermined position, 20 but at the same time leaving the belt pulley M free to be rotated about its spindle X. By this arrangement, the shoes N can be slackened and slid along the top member D of the stand to any 25 desired position and made secure.

The feet B of the stand are formed from lengths of inverted channel section metal, one at the base of each pillar A, B, and disposed at right angles to the top 30 member. The rollers C mounted on a spindle disposed between the limbs of the channel at each end thereof enable the stand to be moved sideways into position over a bed so that the suspended frame R and slings or belts T, T, are in a position 35 immediately above the patient to be lifted. The stand from pillar to pillar is of such length as to permit of the pillars clearing the head and foot of the bed in the operation of pushing the stand side- 40 ways, as stated, to straddle the bed from end to end. In order to anchor the stand, a spring foot Z controlled by a screw enables the foot to be brought to bear on 45 the floor and prevent inadvertent movement of the stand.

In operation, assuming the stand to be placed in position over the bed as herein described, a sling or belt T is passed 50 under the patient's back and also his or her legs and passed over the longitudinal rollers R of the frame suspended from the shoes N slidably mounted on the top member D of the stand and the ends 55 secured together by straps and buckles provided, or other suitable means. To lift the patient, the handle H associated with the gear box G attached to one of the pillars A of the stand is turned to 60 wind up the belting J, L. In so doing, the patient is lifted from the bed. On cessation of the winding operation, the patient will remain suspended due to the

fact that the reduction ratio as between the worm and worm wheel is in the order 65 of 16 to 1, which of course, means that a quick turning movement of the handle effects only a gradual lift of the patient and a braking condition when turning of the handle ceases, without the need for 70 catches or other auxiliary means for maintaining the patient in raised position above the bed.

In cases where it is required to turn the patient bodily whilst suspended, end- 75 less belts or the like would be employed so that these would run over the rollers R and in doing so rotate the patient bodily. If in a condition to do so, the patient could turn himself over by his 80 own effort, in which case, a strap could be suspended from the top member of the stand which would be pulled to effect the turning over movement.

Detail modifications may be made in 85 the structure without departing from the scope of the invention, for example, the stand could be of trestle form, the slidable shoes could be of other construction to that described whilst conforming 90 to the particular requirements. Further, instead of two rollers for the slings or belts as described, a single roller may be provided.

Having now particularly described and 95 ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A hospital appliance comprising a 100 movable stand, a winch or other winding means mounted on the said stand, cords, cables, belting or the like extending from said winch over pulleys or rollers to depend from said stand and slings or 105 other flexible supporting means for attachment to a patient; said slings or other supporting means being supported on a roller or rollers suspended from the cords, cables, belting, or the like. 110

2. A hospital appliance according to claim 1 wherein the movable stand consists of a pair of vertical pillars spaced apart and bridged by a top member and supported on channel section feet pro- 115 vided with a roller at each end.

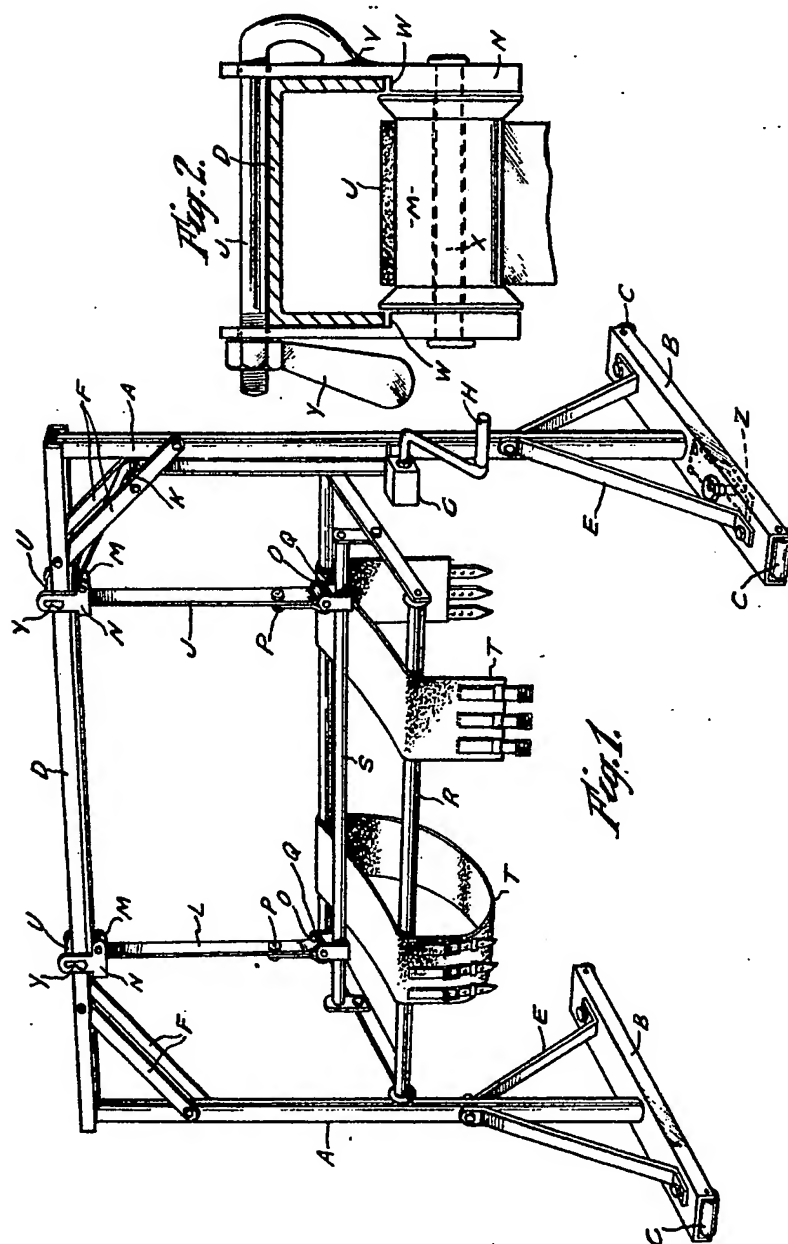
3. A hospital appliance as claimed in claim 1 or claim 2 wherein the free ends of said cords or the like support a rectangular frame having the rollers 120 from which are suspended the slings or like supporting means for attachment to a patient.

4. The improved hospital appliances substantially as herein described with 125 reference to the accompanying drawings.

MEWBURN, ELLIS & CO.,
Dated this 20th day of February, 1947. 70—72, Chancery Lane, London, W.C.2,
Chartered Patent Agents.

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